January 2014

Qualitative Exploration Of Behaviors Related To Positive Child Growth In An Urban Slum Of Mumbai

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Master's Thesis

Yale School of Public Health

May 2014

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Acknowledgments

I would like to thank the SNEHA field team and community health workers, research assistants Kruti Gala and Vidula Naik, and all the families who participated in this project. My sincere appreciation to the Dharavi mothers who welcomed me into their homes and offered sincere friendliness and warmth. Thanks to Devika Deshmukh, Anuja Jayaraman, and Sheila Chanani from SNEHA for their logistical and technical support on the ground.

Special thanks to my advisors Debbie Humphries and Trace Kershaw for their guidance and support throughout the project, and throughout my time at YSPH.

Another special thanks to my family and friends for keeping me grounded, and for their continual support and affection throughout my travels.

This project was funded by the Wilbur G. Downs International Health Student Travel Fellowship and the Office of Student Research at the Yale School of Medicine.

Abstract

Positive deviance research seeks out well-nourished children living in disadvantaged contexts with the intention of identifying local growth-promoting behaviors that contribute to their relatively healthy status. The aim of this study was to explore positive child health behaviors in the Dharavi slum of Mumbai. Children with a height-for-age z-score (HAZ)>0 (n=10) or a HAZ<-2.0 (n=12) were purposefully selected from the Society for Nutrition Education and Health Action's (SNEHA) Child Health and Nutrition program, a child growth monitoring program. Qualitative methods were employed by means of semi-structured interviews with mothers. Eligibility was restricted to households with limited resources and more than one child. A 24-hour dietary recall and anthropometric measurements were taken for the index child. An observation checklist assessed household hygiene. Coding was based on the Grounded Theory of qualitative research. Emergent themes among positive deviant families included: optimal infant and young child feeding practices; maternal information seeking behaviors; adequately managing household hygiene and food allocation; acknowledging the importance of maternal health; and social support. Common among all participants was the consumption of high-energy/non-nutritional snacks, the value of education, and an inability to save money. Findings will be disseminated to SNEHA for program improvement.

Introduction

The traditional approach to studying malnutrition involves seeking out children who are malnourished and trying to analyze how or why they failed to grow properly (Pryer, Rogers, & Rahman, 2004). In contrast, the positive deviance approach focuses on how families succeed in maintaining child nutrition in the face of social and economic hardship (Pryer et al., 2004). The positive deviance approach seeks to understand why there are children who grow and develop adequately while the majority of children living in the same context suffer from malnutrition (Pryer et al., 2004). Positive deviance research is an alternate perspective on nutrition that emphasizes the resilience of families, and focuses on what families are doing right, despite adversity (Zeitlin, 1991). It is an asset-based approach that finds local solutions to child malnutrition by identifying positive health behaviors that contribute to child health status (Bisits Bullen, 2011; Fowles, Hendricks, & Walker, 2005).

Research on positive deviance in the context of child nutrition has been conducted in a variety of settings, including rural China (Guldan et al., 1993), Bangladesh (Pryer et al., 2004), Vietnam (Marsh et al., 2002), and Haiti (Schooley & Morales, 2007). While the grey literature contains significant information on positive deviance, there is limited peer-reviewed research and a notable gap in positive deviance research conducted in urban settings. It is important to study positive health behaviors in local contexts so that they can be incorporated into program planning and intervention design.

Positive deviance research has important public health applications, as it can provide critical and unique insights for nutrition interventions. Since families at high risk of malnutrition are already using these positive behaviors, they are feasible in a resource-

limited setting, are culturally acceptable, and behavior change is theoretically sustainable (Lapping et al., 2002). Nutrition programs that are informed by the positive deviance approach are advantageous because they are based on local concepts of health.

Save the Children's Positive Deviance/Hearth interventions targeted at improving child and maternal nutrition have been successful in Bangladesh, Vietnam, Mali, Haiti, and Nepal (Bolles, Speraw, Berggren, & Lafontant, 2002; Fowles et al., 2005; Marsh, Schroeder, Dearden, Sternin, & Sternin, 2004). These programs consist of identifying local growth-promoting behaviors and practices, and integrating them into community-based nutrition interventions. Programmatic evaluations have shown that these interventions promote behavior change, improving child health and nutrition (Marsh et al., 2004). Positive outcomes from these programs include improved dietary intake, fast weight gain for severely malnourished children, uptake of exclusive breastfeeding practices, and decreased morbidity in intervention communities compared to non-intervention communities (Bisits Bullen, 2011; Mackintosh, Marsh, & Schroeder, 2002; Marsh et al., 2002; Marsh et al., 2004).

Evidence from Vietnam shows that community-based interventions tailored by positive deviance research can sustainably promote positive growth behaviors and outcomes (Mackintosh et al., 2002). Three years after households participated in the Positive Deviance/Hearth intervention in rural Vietnam, younger siblings of the previous index child were significantly better nourished compared to a control group that received no intervention, with mean weight-for-age z-scores of -1.82 versus -2.45 ($p=0.007$), weight-for-height z-scores of -0.71 versus -1.45 ($p<0.001$), and height-for-age z-scores of -2.11 and -2.37 (not significant, $p=0.40$), respectively. This indicates that behavior change can be sustainable, contributing to better growth patterns for children.

Malnutrition in India is a major public health concern. National data indicates that 45% of Indian children under-five are stunted, 17% are wasted, and 33% are underweight (NFHS-3, 2006). Urban slum dwellers are especially vulnerable to malnutrition. Within Mumbai, the prevalence of severe stunting among children under age five is 47% within slum areas, and 42% within non-slum areas (NFHS-3, 2006). Dharavi, known as the largest slum in Asia, is 3 square kilometers in size and home to roughly 800,000 people (Saglio-Yatzimirsky, 2013).

In India, the most commonly identified positive deviant behaviors associated with child nutrition include: providing proper and timely complementary feeding, exclusively breastfeeding for 6 months, maintaining household hygiene, adequately caring for the child, the mother being keen to learn about infant nutrition, and having elders assist with child rearing and food preparation (Kanani & Popat, 2012; Levinson, Barney, Bassett, & Schultink, 2007; Sethi, Kashyap, Aggarwal, Pandey, & Kondal, 2007; Shekar, Habicht, & Latham, 1992). Additionally, elderly women (i.e. mother-in-law/older woman in the household) were identified as having a strong potential role in behavior change programs and community knowledge sharing interventions (Sethi et al., 2007).

Optimal infant and young child feeding practices, as recommended by global standards, are common among positive deviant households (Bisits Bullen, 2011). These practices include exclusively breastfeeding for six months, introducing solid and semi-solid foods at six months, and continuing to breastfeed in addition to complimentary feeding for up to two years. It is pertinent to explore why some mothers practice these behaviors while others in the same community do not.

Positive deviance research methods have not previously been used in urban slums of Mumbai. Considering the health implications and the lack of quality research, positive deviance research could provide important insights for potential nutrition interventions in this context. This study aimed to identify positive health behaviors that exist among mothers with well-nourished children living in Dharavi, Mumbai. The overarching goal was to provide the Society for Nutrition, Education, and Health Action (SNEHA), the partner organization for this project, with information that can be used to improve their Child Health and Nutrition program.

Methods

Design and setting

This study was intended to be descriptive and exploratory. A qualitative design was used in order to explore positive health behaviors and practices among mothers with healthy height-for-age children. Data collection consisted of in-depth household interviews with participants enrolled in the SNEHA's Child Health and Nutrition Program in Dharavi. Recruitment was done through SNEHA.

SNEHA employs a group of women from Dharavi to work as community health workers to conduct monthly household growth monitoring. Community health workers are responsible for designated areas, demarcated by *Anganwadi* center,[1] and are knowledgeable of each household to which they are assigned. As part of the program, community health workers counsel mothers on optimal infant and young child feeding practices, and child healthcare.

Participants

Consistent with traditional qualitative research methods, sampling was designed to capture "information rich" cases in order to ensure the emergence of important key themes (Pope, 2000). SNEHA's community health workers have a vast knowledge of the Dharavi community and played an integral role in identifying households to interview. A purposeful sample of information rich participants was used to capture mothers who could provide insight on the research question.

SNEHA provided growth-monitoring data of 4,209 children below the age of 3 years. Anthropometric indicators were calculated for each child using the World Health Organization Child Growth Standards SAS macro. Children with indicator z-scores less than -6 or greater than 6 were excluded, as these observations were deemed vulnerable to measurement error in the field. All children with a height/length-for-age z-score greater than 0 were potential positive deviants (N=725), and those with z-scores less than -2 were potential non-positive deviants (N=1,374). In order to ensure children were assigned to the appropriate grouping, the sample was further restricted to children with weight-for-

[1] *Anganwadi* centers, part of the government's Integrated Child Development Services, provide daycare services and food supplements to Indian families.

height z-scores greater than 0 for potential positive deviants (N=195) and less than -2 for potential non-positive deviants (N=254), respectively. This produced a condensed, more reliable list of potential participants.

Community health workers were given a list of potential households to sample from each group, and were asked to select participants in accordance with the exclusion criteria. Exclusion criteria included children with no siblings,[2] children who had ever received medical nutrition therapy or weight-gain nutrient supplements,[3] and children whose recorded nutrition status was deemed inaccurate upon household inspection. In order to control for socioeconomic status,[4] children were selected from areas of lower socioeconomic status based on the *Anganwadi* they are assigned to. Community health workers collectively decided which *Anganwadis* represented the most vulnerable households within the SNEHA project area.

Participants were from different geographical areas of Dharavi, so that although all participants shared certain contextual factors of living in a slum, a diversity of other factors were captured, including culture, religion, and family type.

Data Collection

Interviews were conducted from June to July 2013, during monsoon season, and took place in the homes of participants. Interviews were conducted in either Hindi or Marathi by a researcher trained in qualitative methods. Two researchers were present at each interview.

Interviews followed a semi-structured interview guide that included topics on breastfeeding and complementary feeding practices, food security, childcare practices, social support, and child and maternal health (Table 1).[5] The interview guide included probing questions to delve deeper into participant responses. Topics were informed by scientific and grey literature review, and were refined based on informal discussions with community health workers and SNEHA expert advisors. Participants were asked to report all the foods and liquids their child consumed in the 24 hours prior to the interview. In addition, demographics, socioeconomic characteristics, and household observation data were collected. An observation checklist was used to assess household hygiene, where researchers rated the condition of the floor as either "good," "average," or "poor." To assess personal hygiene, the observation checklist included items to gauge whether mother and child were wearing clean clothes (binary responses: "yes" or "no").

[2] Included in order to control for household assets per child. This is based on the idea that families without multiple children will have more assets to spend per child, giving them an advantage that could contribute to their child's positive growth status. Excluding single child families removes this as a confounder in the exploration of positive deviant behaviors.

[3] Nutritional supplements would likely contribute to the child's positive growth, and not necessarily maternal/family behaviors, which is what the study is interested in.

[4] Dharavi is diverse and even within the slum consists of low, middle, and high-income households. High-income households were avoided, because it was clear that these families had the assets to adequately feed and maintain good health for the child.

[5] The tool was developed in English, was translated into Hindi and Marathi by a third party, and was crosschecked for translation accuracy. Two pilot interviews were conducted and appropriate changes were made where necessary.

Interviews lasted an average of 45 minutes and were audio recorded. Household observations were recorded after each visit by both researchers independently. Transcripts were professionally translated and transcribed into English. For accuracy and verification, an independent native speaker of Hindi and Marathi reviewed translations.

Data Analysis

Children were scored on their level of dietary diversity using the Food and Nutrition Technical Assistance's indictor for dietary diversity (FANTA, 2010). To calculate a value for this indicator, the child's 24-hour dietary recalls were scored based on the number of food groups eaten. A score of seven represents the highest possible level of dietary diversity.

Coding for the interviews was based on Grounded Theory of qualitative research, which recognizes pre-existing structures and themes thought to exist within the transcripts (Morse et al., 2009). The initial coding structure reflected what is known in the positive deviance literature and included: optimal breastfeeding and complementary feeding practices, based on World Health Organization recommended standards (FANTA, 2010); having coping mechanisms for times of food insecurity; having an elder female provide advice and guidance on infant care; and providing timely healthcare services to the child.

All transcripts were read in a preliminary analysis in order to inform the coding structure. An inductive approach was used, in that code definitions were expanded and refined as new themes and concepts emerged. A comprehensive coding structure was finalized once consensus was reached between two researchers. Transcripts were coded using ATLAS.ti qualitative research software. Final themes and quotations that emerged were agreed upon by two researchers to ensure validity and balanced representation.

Results

Of the 25 households selected to participate, 3 were not available for interview.[6] The final sample consisted of 22 mothers, 10 with malnourished children (height-for-age z-score<-2.0) (n=12) and 12 with well-nourished children (height-for-age z-score>0) (n=10). The sample size was appropriate in order to reach saturation.

Table 2 presents household characteristics of the sample, by positive deviance status. Participants were diverse with regards to religion and type of family in the sample. Housing construction, number of household members, parental education, and household assets were used as proxies to assess socioeconomic status. Considering the small sample size, there was a relative balance in socioeconomic status between positive and non-positive deviant groups.

Children were categorized based on their feeding practices at the time of interview in the following manner: one child was exclusively breastfed, one child was exclusively milk-fed (i.e. not given breast milk), 9 children were eating solid and/or semi-

[6] Reasons for not participating included the household having gone to the village, and being busy at the time they were approached for an interview.

solid foods while still consuming breast milk at least once daily, and 11 children were completely weaned off of breast milk (Table 2).

The following five key themes emerged as common among positive deviant mothers: 1) they exhibited optimal infant and young child feeding practices, including a high level of dietary diversity and exclusive breastfeeding for six months, 2) food choices were affected by external sources, such as advice from elders and other mothers, and marketing and advertising; this was reinforced by maternal information seeking behaviors, 3) they successfully maintained a hygienic household and managed household food expenditure, 4) they acknowledged the importance of maternal health, and 5) they had social support systems to rely on for help with child rearing (Figure 1).

Common among all participants was the consumption of high-energy, processed food items (such as chocolates and candies) among children of all ages, the high value placed on child education, and an inability to save money (Figure 1).

Below is a description of each theme with supporting quotations from participants. Some words and/or phrases were kept in their original language for difficulty of translation. See Table 3 for English translations as necessary. Quotations are tagged by positive deviance status (PD=positive deviant household; NPD=non-positive deviant household), and the age and gender of the index child (Table 4).

Themes Among Positive Deviant Mothers

1. *Exhibiting Optimal Infant and Young Child Feeding Practices*

Exclusive Breastfeeding for Six Months and Subsequent Weaning

Among positive deviant households, mothers commonly showed indication of practicing optimal infant and young child feeding practices. Many mothers reported breastfeeding exclusively for six months, introducing complementary foods around six months, and subsequently weaning their child off breast milk. There was no strong deviation from these standards.

> *I breastfed him for the first six months. After that I started giving him little rice water and pulse water. After he turned eight months I started giving him rotis and bananas grinded in the mixer.* (PD5; male, age 12 months)

Optimal breastfeeding and complementary feeding practices were not as apparent among non-positive deviant households. Many challenges were presented with regards to breastfeeding.

> *I was breastfeeding from the first day itself, but it was very less. It was only after three to four days that I could breastfeed him adequately…nothing (else)…After four months I started giving him semi liquid food, and after six months I started to give him regular food…(After four months) I started giving outside milk to her with the bottle. Cow's milk.* (NPD6; male, age 13 months)

> *After eight to nine months of her birth I started giving her other food than breastfeeding…I just gave her my milk, nothing else…I am giving her breastfeeding; slowly I have started other food and majority I give breast feeding only. She takes a small quantity in breakfast and other time she has milk whole day…I do not know about the relationship between nutrition and food.* (NPD12; female, age 21 months)

Providing Children with a High Level of Dietary Diversity

Table 4 presents dietary diversity scores calculated for each child. Among children aged 6 months and above, 8 out of 9 positive deviant and 6 out of 10 non-positive deviant children received foods from 4 or more food groups within 24 hours of the interview.

The importance of diversity in the diet and balancing different food groups during the complementary feeding period emerged as a common theme among positive deviant households. Often, seasonal fruits were given to children. Since interviews were conducted in the summer, when mangoes are in season, many mothers reported feeding their child mangoes.

> *Nowadays they eat mangoes, apple…they eat all seasonal fruits. And dal chaval, bhaji and all they eat. They eat meat, fish, everything. In the morning she eats butter or toast with milk. Then after that she has lunch. She likes cheese also, everyone all my four daughter likes cheese, she asks me money first thing in the morning, buy it and eat it. Then they eat eggs, bread, paratha and all, everything they eat…I prepare dal by cooking it and then I beat it and prepare. Then I prepare sabji by putting chilly, masala, onions and all. Chaval and roti*. (PD1; male, age 3 months – mother was talking about the index child's siblings, while the index child was exclusively breastfed)

> *I started (giving solid foods), little of everything, since six months like khichadi…I give her everything, my elder son does not like to eat anything, it was really very problematic for me to feed him, so that is why I started feeding all the things to her, and she likes spicy food, even she is eating chicken and mutton also, I started giving khichadi from six months, and she is having all the things, whatever we eat, I feed the baby also…There is no problem with her feeding, because she is eating all the things, I started giving boiled water after six months.* (PD8; female, age 17 months)

Among non-positive deviant households, mothers reported challenges in child feeding because of taste or the child becoming sick after eating.

> *We tried to give him vegetables but he vomited out. I tried to mix it in rice so that he doesn't realize, made it watery. I tried to give him boiled potato but he does not eat. He will have only two or three bites…He does not like banana, he eats chikoo in small quantities, apple he would eat if we actually force him, but only two or three bites.* (NPD1; female, age 11 months)

24-hour dietary recalls were explored to assess whether there were common foods eaten. Among positive deviant children who were being weaned off breast milk, 4 of them, who were between 10 and 34 months old, were given supplement formula or foods. Formula brands included Cerelac, Bournvita Little Champs, Daxolyte, and Lactogen (See Table 5 for nutritional information). Mothers from positive deviant households reported

giving their children formula powder or other forms of supplemental foods because they believed them to support balanced nutrition, and to be good for the child's health. The use of supplement formula was not prominent in non-positive deviant households.

> *Usually he eats very little, so I started giving Cerelac. Actually, I became pregnant soon after my first child, after eight months of his birth, so I started giving him Cerelac, then I started giving him buffalo milk.* (PD8; female, age 17 months)

2. *External Channels Affecting Positive Food Choices*

Information Seeking Behaviors

Information seeking behaviors were common among positive deviant mothers. Resources from which they reported gathering information include SNEHA community health workers, television programs, and magazines. Mothers sought advice and commonly reported receiving information from doctors or teachers on how best to feed their children, and how to feed them when they are sick. Many mothers knew about oral rehydration therapy.

> *Doctor recommended feeding every 15 minutes, whether the child feels hungry or not. If the child is sleeping, wake them and feed. After coming home, I used to feed every half or one hour… If the child is very small, they drink after every half or one hour. Once they start growing, they drink every 2 hours or 1 hour…Until 6 months it was only breastfeeding. We used to go to the doctor regularly. When I was pregnant, she used to check me. After 6 months, the doctor asked us to give khichadi, daaliya...(I gave) Khichadi, daaliya, and apple and Daxolyte* [powdered formula] *after 6 months…they have apple, mango, and chickoo. All the fruits, like bananas.* (PD9; female, age 34 months)

> *The teachers tell us that we should give khichadi, sometimes giving the medicines that we need to mix with food and give to the children. The sheera that the kids get in Balwadi, we also make that for them…We visit the doctor every once in a month and he only tells us everything (about children's food)…(Now,) he does not drink my milk, he drinks cow's milk. After 8-9 months when my milk was not sufficient for him so I started giving him cow's milk…(Doctor said) to give more water when he is having loose motions. To give water by adding sugar and salt.* (PD5; male, age 12 months)

These mothers sought information on how best to feed children on their own accord. One formally uneducated and illiterate positive deviant mother explained what she knew about nutrition:

> *We learn a few things from T.V. on food channels they show about children…Like if we give sweet lime juice, they get vitamin C, with spinach they get calcium, from egg we get protein.* (PD9; female, age 34 months)

Information seeking behaviors were not apparent among non-positive deviant households. Rather, mothers reported not having access to resources needed to know how to raise a healthy child.

> *I do not understand how to raise a kid actually. They stay with me the whole day yes, but I hit them and then they run away*. (NPD10; female, age 21 months)

However, when asked directly about it, some mothers expressed interest in learning how to best support a growing, healthy child. Mothers were asked whether they would like access to a women's social group where they could share child-rearing advice. Some endorsed the concept, while a few viewed it as futile.

> *We can bring all the women together here and talk to them about nutrition and food for the children or talk about their education, if we do some programs like this, so I do feel it will benefit the people. The more information we get, the better will be the benefit. We can talk to each other, share our thoughts and information, and whatever good information we receive, it will definitely help us whatever goes in our mind.* (NPD6; male, age 13 months)

> *(A women's social group) will not be beneficial, I showed this kid to so many people, but it was of no benefit till now, look at her, she is so weak, I am also doing everything for her, but no use.* (NPD7; female, age 11 months)

Getting Advice from Elders and Other Mothers on Child Feeding Practices

There is a wealth of knowledge among mothers in Dharavi. They learn from each other and from past experiences to ensure best practices.

> *Even my sister-in-law is expecting right now, so we tell her, how to sit, what to eat, she eats fruits, doctor says to eat vegetables. When I was expecting I used to have cravings for meat & fish. I didn't like Dal at that time, I used to like milk, egg, coconut water, etc. that's what we suggest her, to eat healthy food, drink milk mixed with some energy powder, eat green leafy vegetables, and egg.* (PD6; female, age 25 months)

Common among positive deviant households, elder females served as a support system for child rearing, and to give advice.

> *My mother used to tell me (how to start feeding the child). Whenever I have a problem I call up my mother and she tells me what to do…She said from now only if you put the habit of eating everything, it will be better. If you cook separately for them, then they do not eat it. If we make them sit together with us then whatever we eat, they eat…they tell to give banana, apple without the skin.* (PD4; male, age 7 months)

Marketing and Advertising Affecting Food Choices

Marketing and advertising affects how mothers feed their children. Supplemental formula is advertised through television, posters, and other means in Dharavi that exposes mothers to products.

> *Every time they drink milk they want Bournvita mixed in it…From TV, the ad of Kajol (Bollywood actress). Previously I used to give Bournvita, which is for elder people, but when I saw the ad of giving Little Champs to 2-5 year old kids so then I started giving that.* (PD6; female, age 25 months)

3. Successfully Maintaining the Household

Household Hygiene

Most participants reported being busy throughout the day with childcare duties and maintaining the household. A common theme that emerged among positive deviant households was that mothers prioritized household hygiene, and endorsed regular hand washing before meals. From the observation checklists, it was evident that positive deviant mothers maintained cleaner households compared to non-positive deviant mothers (Table 2).

> *I wash everything. My children takes bath twice a day, I don't give them food before washing their hands. First I will prepare food, then I will clean the floor, then I will tell them to take bath and then after that they sit for having food…of course, I wash hands with soap.* (PD1; male, age 3 months)

Responsibility for Food Budget, Allocation & Preparation

Common among positive deviant households was that mothers were responsible for all aspects of food allocation, including budgeting, purchasing, and preparation.

> *I have to go every day (to buy vegetables). I do not have a fridge, so I have to go every day. I only keep onions, potatoes and tomatoes at home. If I need any vegetables, then I have to go to the market…I only have to handle (the food budget). I spend the money. My husband gives me the money. (If my husband does not have enough money) then we borrow from someone and then return it when we can. I borrow from my sister.* (PD4; male, age 7 months)

> *I handle (the food budget in the house). For children, I decide what to prepare for them. Household expenses are handled by me, so everything is done by me only. I get the money to handle the household expense.* (PD9; female, age 34 months)

4. Expressing the Importance Of Maternal Health

Another common theme among positive deviant mothers was the acknowledgment of the importance of maternal health in order to raise healthy children.

> *(Mothers should) eat properly, go monthly for checkups, and…then you will have a healthy baby*. (PD5; male, age 12 months)

Mothers expressed the need to eat properly during pregnancy, after pregnancy to keep up with the child, and to make sure they do not have tension so that they are always fit to raise their children.

> *It is very important to take doctors advice every month (during pregnancy). They check weight and blood pressure, as it is very important. We should continue eating healthy food so that the child is healthy. It is said that the child should be healthy early in the womb itself. So we need to do accordingly…After delivery, breastfeeding is very important. In my case, it was a caesarean but still I had to feed the baby. Until 6 months*

> *I do not give anything apart from milk and water. After that only nutritious foodstuff is required for the child's growth.* (PD9; female, age 34 months)

5. Social Support Systems to Help with Child Rearing

Having a social support network in the community appeared to be a strong resource for positive deviant families. Elder females, siblings, neighbors, and friends were said to assist mothers with child rearing, chores, doctor visits, and food preparation. A common food insecurity coping mechanism was borrowing from friends or family. One mother succinctly explained the benefit of having her mother around to help:

> *(My children) are very small and it would be very difficult to take care of them without my mother. Hence presence of my mother is highly required as she takes care of one child and I am taking care of the other child. The children need their father in the morning and mother at night…. My mother used to take care like preparation of boiled water, feeding food on time so that my child can be healthy, during my pregnant days and even after that. The mother should take care of herself so that the baby is healthy.* (PD2; male, age 19 months)

Many positive deviant mothers received support from their whole family, not only their mother or mother-in-law.

> *If I am going out I leave him* [her son] *with my sister; we both are taking care of them…His grandfather is there, neighbors are there, doctors are there (to get advice regarding food for children).* (PD3; male, age 19 months)

Unfortunately, the benefits of having a social support network were not available to everyone. Many non-positive deviant mothers reported feeling overwhelmed without assistance from family. Reasons for not having help available when needed included family living far away in their native village, family being too busy with their own life to be able to help, or not having anyone available at all.

> *No, nobody supports me…everybody is busy in their work. Nobody has time for each other.* (NPD7; female, age 11 months)

> *There is no support from anyone (to take care of the kids); I have to do whatever I have to do…Because everyone has their kids, father in law, mother in law. So they will look in to their life or they will support me? Everyone is busy with their life…When I need I tell them but I don't feel good to tell them, so I don't tell them. Two sisters are married so their kids are also with her. Two brothers are also married, so she has to look towards them also.* (NPD4; female, age 18 months)

> *Sometimes, I get (support from my family) but sometimes not…They are busy with their work, sister in law is busy with her children and brother is also busy with his work, when we meet each other only then we get time to talk…Me and my husband, no one is there other than us.* (NPD5; male, age 28 months)

> *Her father does not sit much with her, he comes home at six or seven after work, has his dinner, then he goes out roaming and then comes at night, sometimes he sits for some time with the child, otherwise he will go to sleep*. (NPD8; female, age 17 months)

> *There is no support from anyone actually…My parents do not keep me either. I have just one brother and we are four sisters. I do not have anyone.* (NPD10; female, age 21 months)

Themes Among All Mothers

1. *Daily Consumption of High-Energy, Non-Nutritional Processed Foods*

From the dietary recalls, 64% of mothers reported feeding their child chocolate (n=14), 73% fed them sweet tea or other sugary beverages (n=16), and 55% fed them chips or other fried snacks (n=12) within the 24 hours prior to interview. Upon probing mothers about how often they feed their children these foods, it was revealed that they are given regularly, often daily. If the treats are not given directly, mothers give money to their children for them to buy what they like from the shop themselves. Sweets are marketed toward children, contributing to their demand.

> *They eat chocolates of 10-20 rupees every day. Like when I go out I get for them, then my mom gets for them and sometimes my brothers get for them…they like chocolates very much. My son wants to eat good chocolates worth 20 or 25 rupees…now I can't afford so much…I sacrifice my wishes for them and do whatever is possible for them…They see a lot of things on TV and demand that and I will get it for them…It is not very good health wise but it is only that children love to eat it and if we don't buy it for them they insist on buying it and even start crying sometimes. So eventually I buy it for them.* (PD6; female, age 25 months)

Although this mother showed an understanding that giving chocolate to children is not good for health, there was generally not a clear understanding of the health effects of consuming non-nutritious foods with high sugar and fat content. A reoccurring theme among all interviews, regardless of positive deviance status, was that mothers give their child treats, or money to buy treats, to persuade them to behave properly.

> *I do not know whether (chocolates and chips) should be given … I do not know anything, he cries so we give him money. He goes and buys whatever is his wish.* (PD10; male, age 32 months)

Cost does not seem to be much of a deterrent, as high-energy, prepackaged food is readily available in Mumbai slums. Rather, these items are purchased for the whole family.

> *It is not the question of cheap, now if we buy chips and we all eat she will look at us, so we will give her also, like that. We do not buy it exclusively for her, she will eat along with her sister*" (NPD8; female, age 17 months).

2. High Value for Child Education

Many participants expressed concern over their child's education. It was the most common reason for tension among parents, and often the only tension reported.

> *I am worried about their studies as nowadays more fees have to be paid to enroll the child in good school…We do have tension for payment of fees etc. My husband does not get proper sleep in the nighttime when he thinks about such things. I only know how my daughter goes to the school, I have to take money from others to do that.* (PD2; male, age 19 months)

> *Tension of their education is always there. I want them to study well…Each parent has ambition that their children should study properly, and get good marks that is the tension. He is going to the Municipality school since he was 5, but sometimes teachers come and sometimes they do not come. Next year I am going to change their school.* (PD3; male, age 19 months – mother was talking about the index child's sibling)

> *What tension is there, I am only worried about their education. I want them to be well educated in English medium.* (NPD 8; female, age 17 months)

3. Inability to Save Money

It was uncommon for families to have savings, since all monthly earnings go towards household expenses or school admission costs. Formal banking and savings accounts are rare in slums, since they require documentation of permanent address and other formalities that many slum dwellers do not have. As an alternative, families may seek out loans from informal moneylenders.

> *As it is we save nothing…We don't have any account in the bank, so we cannot keep anything there.* (NPD6; male, age 13 months)

> *I borrow money from anyone say 500-1000 rupees and when I get my or my husband's salary, I return them. So that money I use…There is some person called Makadwala. He gives loans on interest…it is inconvenient but what to do? In times of need have to do this…I did not have money in hand and had loans on my head taken from people like 1000 from one 2000 from other, had to repay so again took money on interest to repay them…It happens many times, I was unable to pay interest for 3 months due to my delivery. Then I borrowed 5500 from someone and repaid him. Even I pay BC[7], 2000 rupees a month I pay it's between 50 people. So get 25000-40000 in hand…How can I keep in bank, I have loans to repay…In bank there are a lot of formalities, this document, that document, that's very inconvenient. We don't get money quick enough…Right now I have 2.5lakh loan on my head, but without interest.* (NPD3; female, age 3 months)

> *No, my kids don't get sick mostly, they are very fit and fine. My children know that our parents don't have much money to spend in their treatment, so they don't get sick frequently.* (PD1; male, age 3 months)

[7] Business Correspondents (BCs) extend financial services to low-income populations as part of a venture of the Reserve Bank of India.

Mothers complained about not having enough money to support their household, pay for medical costs, and school admission fees.

> *When we don't have money, then we are not able to buy the medicine, we just keep quiet and pray that our child gets cured. We think that when we will have money then we will buy the medicine, or we have to take loan from someone about 500-1,000 rupees, and tell them that we will return the money when we have it.* (NPD3; female, age 3 months)

> *The fees are increasing everyday…Nowadays no money is left over for savings. Whenever there is no money for my child school fees, we use to take loan from others. Whatever savings we had, we have spent everything for school admission. Now not any money is left over for savings. This room rent itself is 3000 rupees. I am unable to understand how we are going to manage for admission of this child. We do not know whether we will be able to make it over or not.* (PD2; male, age 19 months)

Discussion

An objective of SNEHA's Child Health and Nutrition program is to increase knowledge about optimal infant and young child feeding practices among Dharavi mothers. SNEHA community health workers are trained to counsel mothers on optimal practices, as recommended by global standards. Using community health workers as a platform to deliver services and educate women has proven to be an effective strategy for promoting behavior change (Bhutta et al., 2013). Tailoring the community health worker counseling aspect of SNEHA's Child Health and Nutrition program based on emergent themes of positive deviance has the potential to greater influence behavior change in this community.

The present findings indicate that mothers with well-nourished children have common behaviors, as compared to mothers with malnourished children. These behaviors include: exclusive breastfeeding for six months, feeding children a diverse range of food groups, making well-informed food choices (aided by advice from doctors, teachers, and female elders), maintaining a hygienic household, managing household food expenditure, acknowledging the importance of maternal health, and having access to a social support system for help with child rearing. Common among all households was the consumption of high-energy, processed food items (such as chocolates, chips, and candies), the high value placed on child education, and an inability to save money. These findings are valuable in the local context, and have important practical considerations.

Positive deviant mothers generally practiced six months of exclusive breastfeeding and optimal complementary feeding. Even though all 22 mothers have been taught these standards in some capacity through SNEHA, it is unclear why some mothers do not practice them. Information seeking behaviors emerged as a common positive deviant theme. The present findings suggest that some mothers are more interested in learning about child rearing and the association between nutrition and health outcomes than others.

An interesting consideration is how the relationship between the community health worker and mother affects information exchange, and resultant behavior change. Presumably, a stronger relationship between the community health worker and mother

would engender stronger trust, and as a result more value placed on the information given. This is more likely to lead to behavior change compared to otherwise.

Considering how social support emerged as an important factor of positive deviance, receiving positive support from community health workers could impact maternal behavior change. Community health worker trainings could combine social support and counseling practices in order to strengthen the bond between the mother and community health worker. A stronger bond would influence maternal knowledge and recommendation uptake. Incorporating aspects of social support in nutrition interventions could potentially improve child nutrition and health outcomes, and should be explored further.

Many positive deviant mothers reported having family support them with child rearing, feeding, and by providing advice. Elder females were especially important resources for providing advice on feeding practices and child health. Unfortunately, this social capital was not available to some mothers.

Some women endorsed the idea of a mother-led women's support group as an opportunity for mothers to share advice and information on child rearing. Positive deviant mothers could serve as group coordinators, or assume a mentoring role in the community group. This strategy would allow for information exchange between mothers, and stimulate network building. It would also present an opportunity for women to socialize, and could help supplement care.

Based on dietary diversity indicator scores, positive deviant households seem to have more diversity compared to non-positive deviant households. Although this finding is not generalizable, the information gathered from the interviews suggest that dietary diversity plays a strong role in child nutritional status, as would be expected.

Considering this was a vulnerable population, lack of dietary diversity in some families might be explained by limited purchasing power for food expenditure, which would restrict food choices. However, socioeconomic status was controlled for between the two groups, suggesting that purchasing power was relatively balanced, and that other factors were involved. Some mothers may not be well informed about the importance of diversity in a child's diet. Limited knowledge of nutrition is likely an underlying factor for the difference in child dietary diversity between positive and non-positive deviant households. Although causal associations cannot be made, it can be hypothesized that increasing knowledge of nutrition as it relates to the different food groups will improve feeding practices. Community health worker nutrition counseling would benefit from a component on dietary diversity and nutrition.

Marketing and advertising were identified as influencing mothers' food choices with regards to chocolates and supplemental formula. The marketing and advertising of high-energy, processed foods, and the resulting increased demand of these food items, presents a concern for the increasing prevalence of overweight and obesity in the country (Deepa, Pradeepa, Anjana, & Mohan, 2011).

A nutrition transition has been documented in India, whereby an increasing intake of high-energy, non-nutritional food items, coupled with declining physical activity, has led to increasing rates of obesity and related non-communicable diseases (Misra & Bhardwaj, 2014; Misra et al., 2011; Shetty, 2002; Vaz, Yusuf, Bharathi, Kurpad, & Swaminathan, 2005). It was evident from the present findings that regular consumption of high-energy, processed food is rampant among slum dwellers and their children.

Mothers largely did not understand the health consequences of consuming these non-nutritious snacks. This, coupled with the increasing demand from the children due to marketing and advertising, the wide availability in urban settings, and the relatively low cost, all contribute to population level dietary changes and resulting health outcomes (Zimmerman, 2011). Chocolates, candies, chips, and sugar-sweetened beverages are widely available to slum dwellers in Indian urban centers.

Given the structural forces that shape the nutrition transition in India, there is an urgent need to educate vulnerable populations about the health consequences of consuming high-energy, processed foods. SNEHA community health worker counseling sessions could incorporate discussions about non-communicable diseases and their dietary risk factors, directed at both mothers and children.

It would be interesting to further explore how marketing and advertising affect mothers' food choices regarding supplemental formula. Only positive deviant mothers reported purchasing these items. Perhaps information-seeking behaviors are related to the use of supplemental formula – mothers seek better infant nutrition, and find formula to be a smart choice for child development, as they are advertised. Supplementing a child's diet with micronutrients and protein after exclusive breastfeeding for 6 months is beneficial to health outcomes.

As suggested by UNICEF's conceptual framework on nutrition, care practices are important factors for child nutrition and health outcomes (Black et al., 2008). Exploration of maternal mental health in low-income slum communities, and how mental health affects childcare, is warranted. When asked about stress, most mothers did not say that they felt tension or anxiety, aside from being worried about their child's health, education, and future.

Slum communities suffer from financial exclusion, as they do not have access to formal banking due to logistical and access issues (Bhatia & Chatterjee, 2010). Dharavi has a booming economy, largely based on its leather and pottery production, and has lots of cash flow (Pais, 2006; Saglio-Yatzimirsky, 2013). However, there is inequity in access to financial services and financial education for the poor. Families reported not being able to open a bank account because they require formal documents and proof of permanent address, which many slum dwellers lack. Use of informal moneylenders delves families deeper into debt and poverty. Two families mentioned the use of Business Correspondents to save money, which are part of a venture the Reserve Bank of India is taking towards financial inclusion of the poor. Business Correspondents help provide illiterate and marginalized people with banking services, credit, and financial education. Financial security is important to buffer damage from emergency health costs and high out of pocket payments. This is beyond the scope of SNEHA, but an important consideration for future exploration.

Language barriers required an interpreter to be present for each interview. The interpreter was trained in qualitative methodology, but did not have any previous experience. Responses were back-translated during the interviews, which was not ideal because it disrupted the interview flow. Although there was richness in the data, some open-ended responses from participants were brief. Steps were taken to ensure all participants felt comfortable answering questions, including training research assistants to remain objective and to not make participants feel stigmatized by their responses. This was important, considering there was an apparent power dynamic between participant

and interviewers. Should this study be replicated, it is recommended to have only native speakers be present at each interview.

Considering the qualitative design of the present study, results are meant to be exploratory and descriptive, and are not generalizable. Identifying whether locally identified positive deviant concepts are generalizable at a population level would require follow-up research. Emergent themes of positive deviance, as presented above, can be explored in future studies with larger sample sizes.

A preliminary qualitative approach was necessary in order to capture themes that may have been neglected with other methods, such as surveys with restricted answer choices. An advantage of using a qualitative positive deviance approach is that it gives voice to disadvantaged communities. This method has the potential to capture important concepts that could influence intervention design.

Practical recommendations for SNEHA include: explore ways to incorporate social support and counseling in community health worker trainings; assess feasibility of a mother-led women's social group for mothers to share information on child rearing; and to tailor nutrition counseling sessions to include the importance of dietary diversity, and the negative health consequences of consuming chocolates, chips and candies.

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Appendix

Table 1: Content of the Semi-Structured Interview Guide

Topic	Question
Breastfeeding & Complementary Feeding	Can you tell me about how you fed your child from birth until now?
Breastfeeding & Complementary Feeding	Can you tell me about how you normally prepare food for your children?
24-Hour Food Recall	Please describe everything that (NAME) ate yesterday during the day or night, whether at home or outside the home
Food security	Has there ever been a time when there wasn't enough food to feed everyone in the household? Could you tell me about this time?
Childcare practices	Can you tell me about the time you spend with your child and what you do with him/her while you are caring for them?
Childcare practices	Besides you, with whom does your child interact with most? What do they do with the child?
Social Support	Do you feel supported by your family to help you take care of your children when you are unable to?
Child & Maternal Health	Can you talk about what you do when your child is sick?
Child & Maternal Health	Can you tell me about any stress you have from raising children?
Child & Maternal Health	Do you worry about your child's wellbeing when they get older?
Opinion	We're interested to know the problems you have as a mother so that we can make recommendations to SNEHA about creating programs for the well being of mothers. Do you have any suggestions about how they can best help?
Opinion	If you had double the rupees last month to spend as you please, how would you have spent it?
Opinion	We're interested in your experience as a mother and how you support a growing, healthy child. Is there anything else you can share with us that will help us better understand the things you do to ensure your child is healthy?

Table 2: Household Characteristics of the Sample, by Positive Deviance Status (n=22)

Characteristic	Positive Deviant n=10 n (%)	Non-Positive Deviant n=12 n (%)
Religion		
Hindu	4 (40)	4 (33)
Muslim	6 (60)	7 (58)
Christian	0 (0)	1 (8)
Type of family		
Nuclear	6 (60)	6 (50)
Joint	3 (30)	6 (50)
Single parent	1 (10)	0 (0)
Mother's education		
None	3 (30)	4 (33)
<12 passed	5 (50)	8 (67)
Passed 12	2 (20)	0 (0)
Father's education		
None	4 (40)	3 (25)
<12 passed	4 (40)	8 (67)
Passed 12	2 (20)	1 (8)
Head of household		
Father	6 (60)	8 (67)
Grandparents	3 (30)	3 (25)
Father's brother	1 (10)	1 (8)
Ration card available	7 (70)	6 (50)
Father is employed	9 (90)	11 (92)
Mother is a housewife	8 (80)	11 (92)
House construction		
Pucca (all four walls made of brick)	8 (80)	10 (83)
Semi-pucca (one wall not made of brick)	1 (10)	2 (17)
Kuccha (two or more walls not made of brick)	1 (10)	0 (0)
Number of household members		
Under 5	4 (40)	4 (33)
5 or over	6 (60)	8 (67)
Household assets		
TV	9 (90)	7 (58)
Refrigerator	5 (50)	3 (25)
Mobile	8 (80)	10 (83)
Cooking location		
Sleeping room	8 (80)	8 (67)
Other room	2 (20)	3 (25)
Condition of the floor		
Good	7 (70)	4 (33)
Average	3 (30)	5 (42)
Poor	0 (0)	3 (25)
Child is wearing clean clothes	10 (100)	6 (50)
Mother is wearing clean clothes	9 (90)	8 (67)
Child is energetic	9 (90)	4 (33)
Food and water storage is covered	10 (100)	12 (100)
Feeding Category (age range, in months)		
Exclusively breastfed (3)	1 (10)	0 (0)
Exclusively milk-fed (3)	0 (0)	1 (8)
Solid/semi-solid food & breast milk (7-21)	3 (30)	6 (50)
Solid food only (5-40)	6 (60)	5 (42)

Figure 1: Emergent Themes

Themes Among Positive Deviant Mothers
1. *Exhibiting optimal infant and young child feeding practices* • Exclusive breastfeeding for six months and subsequent weaning • Providing children with a high level of dietary diversity
2. *External channels affecting positive food choices* • Information seeking behaviors • Getting advice from elders or other mothers on child feeding practices • Marketing and advertising affecting food choices
3. *Successfully maintaining the household* • Household hygiene • Responsibility for food budget, allocation, and preparation
4. *Expressing the importance of maternal health*
5. *Social support systems to help with child rearing*
Themes Among All Mothers
1. *Daily consumption of high-energy, non-nutritional processed food items*
2. *The high value placed on child education*
3. *Inability to save money*

Table 3: Translations of Hindi and/or Marathi Words

Food item	Translation
Balwadi	Indian pre-school or primary school
Bhaji	Tomato
Butter	Toast
Chaval	Rice
Chickoo	Chickoo fruit
Daaliya	Porridge
Dal	Lentils
Khichadi	Rice and lentil dish
Masala	Spices
Paratha	Unleavened bread with ghee
Roti	Unleavened bread
Sabji	Vegetables
Sheera	Sweet semolina dish

Table 4: Quotation Codebook & Child Feeding Characteristics

Quote Tag[a]	Child's Age (month)	Child's Gender	Feeding Transition				Dietary Diversity Score[b]
			Exclusive breastfeeding	Exclusive milk feeding	Complementary feeding initiated	Completely weaned off breast milk	
PD1	3	M	X				0
PD2	19	M				X	5
PD3	19	M			X		5
PD4	7	M			X		2
PD5	12	M				X	4
PD6	25	F				X	5
PD7	10	F			X		4
PD8	17	F				X	5
PD9	34	F				X	4
PD10	32	M				X	4
NPD1	11	F			X		2
NPD2	13	M			X		2
NPD3	3	F		X			1
NPD4	18	F				X	6
NPD5	28	M				X	4
NPD6	13	M			X		4
NPD7	11	F			X		2
NPD8	17	F			X		5
NPD9	5	F				X	3
NPD10	21	F			X		2
NPD11	17	F				X	5
NPD12	21	F				X	4

[a] PD=positive deviant household; NPD=non-positive deviant household

[b] Computed with data from 24-hour dietary recalls; based on FANTA's indicator for dietary diversity (FANTA, 2010). The FANTA indicator includes the following 7 food groups: grains, roots, and tubers; legumes and nuts; dairy products (including milk, yogurt, and cheese); flesh foods (including meat, fish, poultry, and liver/organ meats); eggs; vitamin-A rich fruits and vegetables; and other fruits and vegetables.

Table 5: Nutritional information for two infant formulas, per 100g serving[a]

Nutritional Information	Cadbury Bournvita Little Champs	Nestle Cerelac[b]
Energy	374 Kcal	239 Kcal
Protein	9g	1.8g
Carbohydrate	81g	11.9g
Of which Sugar	72g	3.8g
Total fat	1.5g	0.3g
Vitamin B1	1.4mg	15%
Vitamin B2	1.2mg	-
Vitamin B3	15mg	15%
Vitamin B5	2.8mg	-
Vitamin B6	4.5mg	10%
Folic Acid	348mcg	-
Vitamin A	440mcg	6%
Vitamin C	55mg	10%
Selenium	20mcg	-
Zinc	4.5mg	-
Vitamin D	10mcg	-
Calcium	80mg	42%
Potassium	-	7%
Iodine	90mcg	-
Iron	46mg	50%
Source	http://www.thereviewbasket.com/spd.aspx?pid=9cb7e0bf-1d88-4c5d-836a-2c80a0f4d969	https://www.nestlebaby.com.au/products/dry-infant-cereal/cerelac-wheat/

[a] Nutritional information for Daxolyte and Lactogen were not found
[b] Percentages are % Recommended Daily Intake (RDI) per serving